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ABSTRACT

Ninety-five college students participated in an investigation of the arousal and observational learning effects produced by television viewing. The subjects were assigned to one of three experimental television viewing conditions: a serious dramatic presentation with high physical and verbal violence, a comedy with high verbal conflict but no physical violence, and a game show with no violence but with a number of rewarding behaviors. Prior to the viewings, the subjects' aggression levels were measured by means of a questionnaire. A continuous measurement of galvanic skin response was made as the subjects viewed the presentations. After the viewings, the subjects participated in an experimental game which provided them with the opportunity to reward or punish (or refrain from either) a person of the same sex whose role was to provide them with information necessary to achieve a desired goal and who provoked frustration in the subjects by occasionally giving incorrect information. It was concluded that no evidence for a general arousal effect was observed, that evidence of observational learning was found only for prosocial behavior, and that arousal and frustration levels predicted only subsequent antisocial behavior. (FL)

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PRO- AND ANTI-SOCIAL BEHAVIORS SUBSEQUENT TO AROUSAL AND OBSERVATIONAL LEARNING FROM TELEVISION

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PRO AND ANTI-SOCIAL BEHAVIORS SUBSEQUENT TO AROUSAL AND OBSERVATIONAL LEARNING FROM TELEVISION

Theories relating television viewing to subsequent behavior can be classified according to the postulated intervening mechanism by which television viewing produces an effect on behavior. Watt and Krull (1977) labeled the three major models Facilitation, Catharsis and Arousal. The Facilitation model relies on an observational learning or modeling process to affect subsequent behavior; the Catharsis model utilizes drive-reduction by a fantasy mechanism; and the Arousal model postulates an intermediate generalized drive-enhanced state which is translated into later behavior. The Catharsis model predicts results contradictory to those predicted by the other two models. It suggests that individuals who view violent programming, for example, subsequently will be less likely to behave aggressively even under social conditions which allow such behavior. Both the Facilitation and the Arousal models predict subsequent increases in aggressive behaviors under such conditions, however.

The Catharsis model has received little experimental or field study support, although catharsis effects have been reported (e.g., Feshbach and Singer, 1971). The overwhelming majority of studies, however, have reported either Facilitation (observational learning) effects or Arousal (excitation transfer) effects.

The Facilitation and Arousal models are not mutually exclusive, as both mechanisms may operate concommitantly. Thus, these two models are particularly difficult to distinguish from one another in practice. Experimental studies of violent television viewing usually find subsequent increases in aggressive levels or behaviors, which may be explained by either of these two intervening processes. One may say that the subjects have learned and then chosen to enact the aggressive behaviors modeled in the program and/or that the subjects have become physiologically aroused as a result of the violent depictions in the program and that this arousal produces the increased aggression. The Arousal model, however, does make one unique

prediction: increases in behaviors of all kinds should occur as a consequence of viewing all types of arousing material, rather than just increases in modeled behaviors. The Arousal model thus encompasses but is not limited to aggressive behavior subsequent to violent depictions.

The question of the correct model is not an insignificant one. If the Arousal model is correct, attempts to reduce audience aggression by limiting the amount of televised violence will have only limited effectiveness. Other television fare which produces arousal will still potentially produce increased aggressive behavior in the audience. On the other hand, if the Facilitation or observational learning model is correct, the policy called for is clear; reduce televised violence alone in order to reduce audience aggressiveness.

Both models have extensive support. The classic work of Bandura (cf. Bandura, Ross and Ross, 1961; 1963a; 1963b; Bandura, 1965) and Berkowitz (cf. Berkowitz, Corwin and Hieronimus, 1963; Berkowitz and Geen, 1966; Geen and Berkowitz, 1967) present experimental evidence that subjects learn from or are "cued" by violent behaviors in a mediated communication and subsequently carry out the same or a similar set of aggressive or violent behaviors. Other non-experimental evidence for the Facilitation model can be found in numerous surveys of the viewing habits of children and adolescents and their aggressive levels (cf. Lefkowitz, et al, 1972; Robinson and Bachman, 1972; McLeod, Atkin and Chaffee, 1972a, 1972b).

The Arousal model has also received support in the work of Tannenbaum (cf. Tannenbaum, 1971, 1972), Zillman (cf. Zillman, 1971; Zillman, Hoyt and Day, 1974) and Meyer (1972) among others. In general, these studies have shown the ability of non-aggressive material to produce physiological arousal which then is associated with elevated levels of subsequent aggressive behavior. However, all of these studies have a serious external validity flaw in terms of commercial television: the experimental condition representing non-violent arousal is often an erotic film. Clearly, erotic films are not normal network fare.

Some attempts to reconcile the Facilitation and Arousal models have been made. In a reanalysis of survey data from the McLeod, Atkin and Chaffee (1972a, 1972b) studies, Watt and Krull (1977) found evidence for independent arousal and facilitation effects. However, the agent of arousal assumed in this study was the form complexity of the television programming, rather than the emotional content arousal postulated in the Tannenbaum, Zillman, and Meyer studies. Form complexity presumably produces arousal as a result of the cognitive decoding "work" demanded by complex televised messages.

In another study, Watt and Krull (1975) attempted to separate the emotional arousal responses from the form complexity arousal responses of young adults. They found evidence of independent form complexity arousal and emotional arousal effects. The agent of arousal in television programming thus appears to be both the form (form complexity) and the message (emotional conditioning) of the program.

The interaction between viewer arousal and message content has also received some scrutiny, and represents yet another point of overlap between the Arousal and Facilitation models. Buck (1976, pp. 173-174) describes an experiment in which subjects were shown an arousing sports film and an unexciting control film. Subjects in the sports film condition indicated higher levels of excitement on a self-report measure but showed no increases in subsequent aggressive acts, compared to the control group. However, the measurement of arousal in this experiment is somewhat questionable insofar as it was not based on physiological data.

Liebert and Baron (1972) report an experiment in which subjects were shown either a violent videotape or a presumably exciting, but nonviolent sports videotape. In this experiment, responses subsequent to viewing were not limited to aggressive behaviors, but could be either "helping" or "hurting". They reasoned that both types of behavior should show increases (due to enhanced drive levels) after viewing arousing material, if the Arousal model holds. On the other hand, if short-term learning is the mechanism, more "hurting" responses should be observed in the aggressive videotape group.

They observed a significant difference between viewing groups indicating a Facilitation effect. They also observed no difference in "helping" responses between the groups and interpreted this as evidence against an arousal effect. However, this interpretation may be questioned if the non-violent videotape produced excitement or arousal comparable to the levels of arousal produced by the violent videotape. If it did, one would expect to observe similar "hurting" responses in both groups, and this was not the case. Further evidence against an arousal effect reported by Liebert and Baron was in the observation of significantly lower intensities of "helping" responses than "hurting" responses.

There is thus evidence both for and against the general Arousal model. The interrelationships between arousal processes and facilitation processes are also unclear, as are the effects their interactions may have on subsequent pro- and anti-social behavior.

The experiment reported in this paper investigates both Facilitation and Arousal processes in young adults. It had several major design objectives. First, the stimulus material was to be relatively representative of material normally shown on commercial television. Second, the social situation set up to measure after-viewing behavior was to : (a) allow for equally easy choices of either pro- or anti-social behavior; (b) ensure that these behaviors are perceived by subjects to be real and effective; and (c) provide a goal toward which the subject can be motivated, so that (d) each subject would receive some level of frustration in the after-viewing situation.

The hypotheses outlined below are taken from both facilitation theories and from Arousal theories. Their support or lack of support provides implicit tests of the degree to which Facilitation and/or Arousal processes occur.

HYPOTHESES

H1: Viewers of violent programming will exhibit more arousal than viewers of the other programming.

Action-adventure shows which feature high levels of physical violence

should be more arousal-inducing as a result of prior emotional conditioning against acts of violence.

H2: Viewers will exhibit disinhibition to the class of acts depicted in the shows viewed.

Short-term observational learning is the postulated mechanism for disinhibition. Viewers of violent acts are expected to be more willing to punish and viewers of giving acts are expected to be more willing to reward in subsequent situations which may call for a choice of either behavior.

H3: Prior levels of aggression will be related to physiological responses to programming.

This non-directional hypothesis is stated speculatively. There are several rationales for it. It is possible that high prior levels of aggression are the result of heavy violent television viewing via an observational learning mechanism. This heavy viewing might produce a desensitation effect, the postulated emotionally conditioned response to violent depictions. It is also possible that persons with high levels of aggression are inherently more easily aroused, and that this ease of arousal is transmitted to such social acts as aggression, thus, high prior levels of aggression may be associated with either higher or lower arousals.

H4: The higher a person's prior level of aggression, the more he or she will use punishment to achieve goals, even where reward is appropriate.

This is almost a self-evident hypothesis. We label persons as aggressive at least partially because of their willingness to punish. However, given a social condition in which either punishment or reward is an equally appropriate response, it is not self-evident that punishment will be the chosen response. It is hypothesized that punishment will be chosen because it is a more common, and perhaps habitual, activity for more aggressive persons.

H5: The higher a person's level of arousal, the more he/she will display activity of all kinds.

The rationale for this hypothesis is basic to arousal theory. Higher arousal is presumably indicative of an enhanced drive-state, and the amount of any appropriate activity subsequently displayed should be greater.

H6: The higher a person's frustration, the more he or she will use punishment to achieve goals.

This is simply a statement of the common frustration-aggression hypothesis. Presumably there is an innate aggressive drive which manifests itself under conditions of frustration. Since frustration is thus an alternative mechanism by which aggressive behavior is explained, it is necessary to measure and control for it in order to determine unequivocally whether Facilitation and/or Arousal effects take place.

METHOD

Fifty male and forty-five female subjects were assigned to one of three experimental viewing conditions. These were (1) a serious dramatic presentation with high physical and verbal violence; (2) a comedy, with high verbal conflict, but no acts of physical violence; and (3) a game show, with no physical or verbal violence, but with a number of rewarding behaviors. These three shows were chosen to present a range of rewarding and punishing behaviors. This presumed range considered the dramatic presentation to be highest in punishment behaviors and the game show to be highest in reward behaviors.

Prior to viewing, subjects' aggression levels were measured with a questionnaire instrument. While viewing, continuous measurement of galvanic skin response (skin resistance) was made. The measure of physiological arousal was used as a causally intermediate variable, being the dependent variable for analyses of the viewing condition, and the prior independent variable for the subsequent behavioral measures.

After viewing, the subjects were engaged in a seemingly unrelated experiment which actually provided them with the opportunity to reward or punish (or refrain from either) a person of the same sex whose role was to provide them with information necessary to achieve a desired goal. This person also provoked frustration in the subjects by periodically giving incorrect information.

Figure 1 summarizes the variables and hypotheses tested in this experiment. The hypotheses relating show condition and prior aggression level to physiological arousal were tested by 3 x 2 analysis of variance, with show type one independent factor and prior aggression level, dichotomized via a mean split, the other independent factor.

The hypotheses relating show type to subsequent behaviors were tested by an analysis of covariance with show condition the independent factor and prior aggression level and arousal level the covariates.

The hypotheses relating prior aggression level and arousal to subsequent behavior were tested in two ways: first, by considering arousal as an exogenous variable, essentially ignoring the show condition predecessor of arousal. In this analysis the source of arousal is ignored, and only the effects of arousal on subsequent behavior are considered. In the second analysis, the subjects are split according to the show condition in which they were assigned. Here the source of arousal is explicitly included in the analysis.

VARIABLES

Show condition. This nominal variable is defined as the categorical type of show viewed. The three categories operationalized in this experiment were "action-adventure", "comedy", and "game show."

Prior aggression level is defined as agreement with statements favoring physical assault or violence, verbal hostility, and indirect or displaced acts of violence on inanimate objects. It is operationalized as the sum of responses to 13 items drawn from the Zaks and Walters (1959) aggression index and the Buss and Durkee (1957) inventory. Responses were on five-point Likert-type scales, with the scale points labeled "strongly agree", "agree", "neutral", "disagree" and "strongly disagree." The possible range of values on this measure was thus from 13 (strong agreement with all statements), to 65 (strong disagreement with all statements.)

Arousal is defined as generalized activity of the autonomic nervous system. It is operationalized as levels of skin resistance. GSR measurements were computed by taking the difference between the unstimulated, resting GSR of each subject and readings taken at 10-second intervals. These readings (approximately 125-150 per subject, depending on show condition) were averaged to produce a single value for each subject, expressed in kiloohms.

Total Rewarding Behavior is defined as the extent to which a person provides another with desirable items or benefits. It is operationalized in this experiment as the total number of real credit points awarded by the subject to another player. The number of plays in the game was fixed at 16, and the player could choose to reward, punish, or do neither on each play (see experimental procedure for a full description of the game). The degree of reward or punishment was variable at the discretion of the subject, so the theoretical range of this variable was from zero to a very large number.

Number of Rewarding Behaviors is defined as the number of choices to reward another to any extent, rather than to punish or do neither. It is operationalized as the number of times each subject chose a reward response of any magnitude, and has the range of zero to 16 for the experimental game.

Intensity of Rewarding Behavior is defined as the average magnitude of reward given, when a rewarding mode of response is selected. It is operationally defined as the Total Rewarding Behavior divided by the Number of Rewarding Behaviors.

Total Punishing Behavior is defined as the extent to which a person takes desirable items from or hurts another. It is operationalized in this experiment by the total number of real credit points taken by the subject from another player. Like Total Rewarding Behavior, this variable is not fixed in magnitude, as the player was free to punish to any degree, and thus the variable can range from zero to a very large number.

Number of Punishing Behaviors is defined as the number of choices to punish another to any extent, rather than to reward or do neither. It is

operationalized as the number of times each subject chose a punishment response of any magnitude, and thus has a range of zero to 16.

Intensity of Punishing Behavior is defined as the average magnitude of punishment given, when a punishing mode of response is selected. It is operationally defined as the Total Punishing Behavior divided by the Number of Punishing Behaviors.

Aggregate Behavior is defined as the overall balance of a person's rewarding and punishing behaviors. It is operationally defined as the total rewarding behavior minus the total punishing behavior, and since these are not bounded the result can range from a very large negative number (an aggregate of more punishment than reward) to a very large positive number (more reward than punishment). The zero-point of the measurement represents an equal balance between rewards and punishments.

Total Behaviors is defined as the extent to which a person responds with both rewarding and punishing behaviors. Thus, it represents the extent of activity in general. It is operationally defined as the sum of the Total Rewarding Behavior and the Total Punishing Behavior.

Frustration is defined as the extent to which a person is prevented from reaching a goal toward which he or she is motivated. It is operationalized in the experimental game by the number of incorrect moves made by the subject, for which they are penalized real credit points. Frustration is produced both by acting on the incorrect information given by the accomplice and by disbelieving correct information. This variable is thus not held constant by the experimental design, but is measured. The manipulation (accomplice untruthfulness) which produces the response is constant, however.

EXPERIMENTAL PROCEDURE

Subjects were obtained from an introductory communication course subject pool at the University of Connecticut. Each signed up for an individual experimental session and was instructed to come to the lobby of the experimental building. There they were met by an experimental assistant of the opposite sex and conducted to the experimental room. This room, which was about the size of an average living room, was decorated with a couch, easy chairs, indirect table lamp lighting and rug, etc. in an attempt to simulate as closely as possible a normal viewing environment.

The subject was asked to fill out a preliminary questionnaire concerning "attitudes and opinions". This questionnaire contained 13 items drawn from the Buss-Durkee hostility and aggression inventory (Buss-Durkee 1957) and the Zaks-Walters aggression index (Zaks-Walters 1959). These items were interspersed with 17 other dummy items which were not analyzed. The dummy items were added to dilute the pretest sensitization effect, and to mask the nature of the hypotheses being tested.

The subject was then seated in an easy chair facing a large television monitor. He or she was then told that the purpose of the experiment was to measure people's physiological responses to different television programs. The GSR electrodes were attached in a bipolar configuration to the first and third fingers of the left hand. The electrode leads, along with the coaxial cable for the television monitor, were routed through the soundproof wall separating the experimental room from the equipment control room. Save for these thin GSR leads, the subject was in a fairly normal viewing situation.

The subject was told that the experimenter would be in the next room monitoring the equipment, and would be occasionally observing through a small one-way mirror window partially hidden behind some drapes. He or she was asked to make him/herself comfortable, as the equipment would require about five minutes to stabilize. He or she was also asked to move only when necessary for comfort during the television program, as movement would affect the physiological readings.

The subject was left alone in the room with no picture or sound on the monitor while a GSR baseline reading was obtained. After the novelty of the situation had faded and the GSR reading had remained constant for at least a minute, the video taped program was started. GSR stabilization typically required from five to ten minutes. All GSR measurements were then expressed in deviations from this stable baseline, as the actual skin resistance of individuals varied widely.

Videotapes were chosed randomly for males and females, so that approximately equal numbers of each sex were assigned to each of three viewing conditions. The first tape was an edited version of the movie "Walking Tall", as shown on network television. The tape was edited into a 21 minute condensed version of the first half of the movie which ended with a dramatically climactic courtroom verdict. The narrative was retained in the edited version of the final tape. (in fact, one observer thought that the edited version was better than the original). The second tape was a complete broadcast episode of "The Jeffersons", with only the commercials edited out. The third condition was a similarly edited tape of the game show "The Price is Right". Both of these tapes ran 22½ minutes. The three tapes will be referred to as

the WT, JEFF, and PR conditions.

While the subject viewed the tape, the experimenter's assistant and accomplice observed the subject through the observation window and recorded any visible motion of the subject by pressing a button which recorded the event on the GSR chart drive. The GSR readings were later corrected for subject movement by assuming that any GSR level shift in the 10 seconds following a recorded subject move was a result of movement. This shift was "depreciated" over the next two minutes by subtracting linearly decreasing percentages of the shift from each subsequent GSR reading since it was previously determined that a normal time for recovery to the GSR value before movement was two minutes under no stimulation conditions. Thus, the first GSR reading after a movement had 100% of the difference subtracted, the next reading 11/12, the next 5/6, etc.

At the end of the tape, the experimenter went back into the experimental room and removed the GSR leads. The subject was then asked to fill out another questionnaire concerning his/her reactions to the program and prior exposure to the program viewed. The subjective reactions were semantic differential type polar adjectives and are not analyzed here. As the WT and JEFF episodes were taped during a prior television season, and the PR program in general has low student viewership, only three of the 95 subjects reported prior exposure to the stimulus material.

While the subject filled out the post-test questionnaire, the experimenter's accomplice, who was the same sex as the subject, entered a waiting room near the experimental room. The experimenter then told the subject that "I'm running another experiment for a graduate student thesis, and it requires two persons. One person has shown up, but the other has not. Would you mind staying for another 15 minutes to help out?" The subject was offered additional experimental credits (a minimum of which are required as part of the introductory course requirements.) Only one student refused to stay and had to be eliminated from the analysis.

The subject was then taken into the waiting room and introduced to the accomplice, who was presented as the other student subject for the next "experiment." This "experiment" was described as concerning information transfer under conflict situations. The experimenter explained that one of the two subjects would be assigned to play a "prisoner of war" and the other an "interrogator" in a board-type game. The object of the game was for the interrogator to gain enough information to move through the squares laid out on the board (a "mine field") with a minimum loss of "men". A "man" was lost each time the "interrogator" made an incorrect move. The prisoner of war was to conceal as much information as possible. The interrogator was given the ability to reward or punish the prisoner of war by giving or taking experimental credit points in order to gain the most accurate information.

It was explained that in order to make the situation realistic, the interrogator would himself receive experimental credits in proportion to the number of "men" who successfully negotiated the "mine field", and the prisoner of war would actually receive the credits given or taken away by the interrogator. Since experimental credits were necessary for introductory course credit, both participants should have been highly motivated. Pretesting of the game and debriefing supported this presumption.

In actuality, the accomplice was always assigned the role of the prisoner of war and the subject the role of interrogator. The experimenter went over the rules of the game with both participants, and answered questions about play. The accomplice always asked the question "Am I allowed to lie?", and the experimenter answered in the affirmative.

After the experimenter was sure the subject understood the game and the "real" nature of the punishment and rewards, he or she informed

the participants that in order to limit the exchange to verbal communication and rule out non-verbal cues as to the truth or falsity of information, each participant would be in different rooms, and the game would be played on identical boards via an intercom. The experimenter would monitor the game and inform the players of correct or incorrect moves.

The subject was returned to the experimental room and an intercom set up. Both the accomplice and the experimenter returned to the control room and after a suitable period of time (ostensibly to set up the "prisoner of war" in another experimental room), began the game.

The basic format of the game involved the subject asking the accomplice if it was safe to move into a particular square on the board. Before an answer was given, the subject (the interrogator) would reward or punish the accomplice (the prisoner of war) or do neither. The degree of reward or punishment could be varied, with each unit representing .1 of an experimental credit (a total of eight experimental credits were the introductory course requirement). A typical exchange would be:

SUBJECT: Is it safe to move into square R3? Reward 3 units.

ACCOMPLICE: Yes.

After each move by the subject, the experimenter would inform the subject over the intercom of the outcome (correct move or incorrect move), and the result (e.g. "Correct, you still have 14 men" or "Incorrect, you lose a man. You now have 13 left"). If the move was incorrect, the experimenter would state the correct move and have the subject move the playing piece to that square and continue the game. Thus, because incorrect moves were corrected by the experimenter, each subject had exactly 16 plays.

The accomplice responded to all questions with either "yes" or "no", uttered as consistently blandly as possible. Every fourth move the accomplice would give incorrect information, so that there were 12 correct and 4 incorrect answers given during each game session.

After the game was completed, the subjects were given two "departmental experimental evaluation forms" to fill out, one for each of the "experiments." These forms requested that the subjects list the nature of the experiment, whether it involved variable or predetermined credits, whether it was related to other experiments they had participated in, and their evaluation on several dimensions of the experiment. In addition, the form asked the subjects to describe briefly what they thought the purpose of the experiment was. In actuality, these forms served as an unobtrusive check on the experimental manipulation. None of the subjects detected the relationship between the television viewing situation and the game playing situation, and all believed that they were actually giving and taking credits from the accomplice.

To maintain the necessary deception for the duration of the experiment, each subject was given the actual number of credits earned during the game, as promised by the experimenter. Subjects were not debriefed until all subjects had been run. Based on the "experimental evaluation form" results, it is safe to conclude that no contamination of new subjects by former subjects took place, and that each subject was naive as to the real hypotheses being tested.

To summarize this fairly complicated procedure, each subject:

a. Filled out a pretest aggression level scale.

b. Viewed one of three videotapes while having GSR recorded.

c. Played a seemingly unrelated game which featured:

1. Variable rewards and punishments which the subject perceived to be real and which were directed at another person.

2. A motivation to perform well in order to gain personal reward.

3. Frustration induced by another's untruthfulness.

RESULTS AND CONCLUSIONS

Show Condition and Arousal.

The first hypothesis, that the show conditions would provide differential arousal levels, was supported, as Figure 2 and Table I indicate. The GSR measure of arousal was above baseline (indicating increased arousal) for subjects with both low and high levels of prior aggression in the WT condition, while it was actually lower than resting baseline for all persons in the JEFF condition. The PR condition produced near-baseline levels of arousal. Thus the idea of emotional arousal received experimental support. Although it appears that subjects with higher levels of prior aggression responded to the WT condition with higher levels of arousal than did subjects with lower levels of prior aggression, there were high standard deviations of the arousal levels. Because of the wide variation in response, no significant effect due to level of prior aggression was found. Hypothesis 3 relating the levels of prior aggression to physiological response was thus not supported.

Hypothesis 2 predicted that the show content would produce subsequent behaviors in the subjects consistent with the behaviors depicted in the shows viewed. Figure 3 and Table II summarize the tests of this hypothesis.

Show Condition and Pro-social behavior. No relationship between the show viewed and the number of rewarding behaviors was found, but significant relationships between show viewed and the total reward given and the intensity of reward for each rewarding move were found. The cell means from Table II indicate that subjects who saw the violent program rewarded less than those who saw the game show, lending some support to the Facilitation hypothesis in the pro-social direction. However, the comedy program produced the very lowest levels of total reward. Reward intensity followed the same pattern.

Show Condition and Anti-social behavior. The only significant relationship between show condition and punishing behaviors was for the intensity of punishment given when punishing responses were chosen. However, as Table II shows, the cell means are in the opposite direction to that needed for support of an Observational learning hypothesis. There is thus no support for the Facilitation model in the anti-social direction.

Show Condition and overall behavior. An examination of the grand means in Table II shows that subjects overwhelmingly chose rewards rather than punishment to achieve their goal in all show conditions. The significant relationship between show viewed and the total behavior of both types is quite interesting. Subjects who viewed the comedy responded much less than subjects who viewed the violent presentation, who in turn responded less than subjects who viewed the game show. These results, in conjunction with the pro- and anti-social behavior breakdowns make it clear that subjects responded freely in the reward direction but restricted responses in the punishment direction. This propensity is further illustrated in the relationship between show condition and the overall aggregated response which operationally permits a reward to cancel out a punishment. The grand mean shows the tendency for all treatment groups to respond with more reward than punishment. Since there was little difference in degree of punishment between show conditions, and there are reasonably large differences in the aggregate cell means (although these did not quite reach a .05 level of significance), it is apparent that subjects arrived at their overall reward/punishment figures by varying the rewards while leaving the punishments at similar levels between treatments.

On the whole, the results indicate that the Facilitation model held only for pro-social behaviors, and not for anti-social behaviors. One must recognize, however, that these analyses of covariance held constant levels of arousal (which were shown to systematically vary with the show

viewed), and thus reflected a "pure" test of the Facilitation model, rather than a realistic test.

Arousal and behavior: general considerations. The relationship between arousal and subsequent behavior presents a difficult analysis task. Because of the nominal nature of the show conditions, it is difficult to separate out the effects of the show, which include Facilitation effects, from the effects of the arousal. Unlike the analyses of covariance which permitted easy "removal" of the effect of arousal from tests of relationships between show viewed and subsequent behavior, the effect of the show type can be removed from the tests of the effects of arousal on behavior only by partitioning the sample into the nominal treatment groups and conducting parallel analyses. However, since we are assuming all non-error effects on behavior to be a result of either Facilitation or Arousal effects, we can make some logical deductions by examining the arousal-behavior relationships and contrasting them to the show condition--behavior relationships just discussed.

Multiple tests of the remaining three hypotheses (H4, H5, and H6) relating arousal, prior aggession level, and frustration to subsequent behavior are included in the following discussions.

Arousal and pro-social behavior. Figures 4, 5 and 6 summarize the relationships between arousal and subsequent rewarding behavior while explicitly including prior aggression level and subsequent frustration in the predictive models. For each behavior analyzed, the overall relationship from all show conditions is first presented. This relationship essentially ignores the source of the arousal. Separate relationships for each of the show conditions are then presented.

Taking all show conditions into account, only the total amount of reward given can be predicted from arousal levels at significantly better than chance levels. Even this relationship is weak, explaining only about 3% of the variance in total reward. Lack of frustration is overwhelmingly

the best predictor of number of rewards, total reward, and reward intensity.

The Frustration-Aggression hypothesis thus finds support, and the Arousal model finds very weak support. There is no support for the hypothesis relating prior levels of aggression to subsequent pro-social behavior.

When examining the violent program condition, a similar set of results are found. Lack of frustration still predicts rewarding behavior significantly, while arousal will not predict any pro-social behavior variable at better than chance levels.

A different and somewhat strange set of results are found in the comedy viewing condition. Lack of frustration takes on a reduced role in predicting reward variables, and arousal becomes more significant, explaining over 25% of the variance in intensity of reward in this viewing condition.

In the game show condition, frustration (or rather its lack) again becomes the important variable, significantly predicting all pro-social variables except number of reward behaviors, which was not predicted by any variable.

In terms of pro-social behavior then, it is safe to conclude that overall evidence supporting the Frustration-Aggression hypothesis was found, but that Arousal effects seem tied in some way to the show viewing condition which produced the arousal.

Arousal and anti-social behavior. Ignoring the source of the arousal, one concludes from Figures 7, 8 and 9 that both the Arousal model and the Frustration-Aggression hypothesis are supported in terms of anti-social behavior. The number of punishing behaviors exhibited and the total punishment given are both significantly predicted by both frustration and arousal level, with increases in both leading to increases in punishment. The intensity of punishing behaviors is also predicted by arousal, but

not by frustration. Again, no relationship is found between prior aggression level and any punishment variable.

The results for the violent program condition are identical to those for the aggregate of all viewing conditions, although the strength of relationship between arousal and punishment variables is somewhat stronger in this condition.

The comedy viewing situation again presents some markedly different results. NO variable predicts punishment variables at better than chance levels for viewers in this condition. There is no evidence for any arousal, frustration, or prior aggression effect in this viewing condition.

The game show gives yet another set of relationships. The strength of relationships are similar to those found for the "All Shows" analysis, but the arousal to behavior relationships fail to reach significance because of the reduced number of subjects in the PR condition. It can only be concluded that frustration produced increased levels of total punishment and number of punishments in this viewing condition.

Arousal and overall behavior. The purest test of the arousal model is contained in Figure 10, which summarizes relationships between arousal and total behavior of all kinds. Theoretically, both rewarding and punishing behaviors should increase with increases in arousal. There is no support in any of the viewing conditions or in the "all shows" condition for the Arousal model. The Frustration-Aggression hypothesis cannot be tested with the overall behavior variable, since it is non-directional, but it is interesting to note that the frustraton level is negatively related to the amount of behavior in all conditions, and is statistically significant for the "all shows" and the WT violent condition. Under frustration, subjects apparently reduced their total behavioral output. If it is assumed that frustration produces arousal, this finding can be taken as evidence directly

contradicting the Arousal model, as one would expect that arousal would be translated into increased, rather than decreased, levels of behavior.

When one includes the "sign" of the behavior in either the pro- or anti-social direction, it becomes clear (see Figure 11) that arousal level predicts the aggregate response of subjects. Only in the PR condition did arousal fail to predict the aggregate response at better than chance levels. Likewise, frustration predicted aggregate response in all conditions except the JEFF condition. Lower arousal predicted more pro-social response, as did lack of frustration.

DISCUSSION

We are confronted with two difficult tasks in the discussion of these results: first, to make some comprehensive statement about the meaning of a large number of statistical tests; and second, to attempt a post-hoc explanation of some highly interesting and unexpected results. Taking the first task first, let us summarize the results briefly:

1. The dominant mode of behavior chosen by the young adult was strongly in the pro-social direction, even when frustrated and after viewing violent material.

2. Violent programming produced elevated levels of arousal.

3. The show viewed is clearly related to indicators of pro-social behavior in a way which supports an Observational learning or modeling theory, when the arousal level of the viewer is controlled.

4. The show viewed is not a good predictor of anti-social behavior when arousal is controlled.

5. Prior aggression level does not predict either pro- or anti-social behavior levels.

6. Arousal is not strongly related to the levels of pro-social behavior, while lack of frustration is strongly related.

7. Arousal is related to levels of anti-social behavior, as is the degree of frustration. Arousal is more strongly related in the violent viewing situation than the other viewing conditions.

8. There is no evidence for a generalized Arousal model effect.

9. When considering all behaviors in a single summary fashion, aggregate response is a result of both arousal and frustration, and (not so confidently) the show viewed.

What we seem to be describing is a situation in which causes (or at least predictors) of pro-social behavior are different from the causes of anti-social behavior. Increased pro-social behavior appears to be a result of televised exposure to similar behavior and lack of frustration. Increased anti-social behavior appears to be the result of arousal and frustration.

If this finding can be considered generally true, (a sweeping generalization, as the subjects of this experiment were high SES, highly socialized young adults) pro-social behavior could be increased by removing sources of frustration and by increasing pro-social content in the television medium, but there is no direct implication that anti-social behavior would be decreased by decreasing violent content. Other than reducing frustration (which is a bit out of the mass communicator's normal abilities) the prescription for reducing anti-social behavior would be to reduce arousal in audience members. If arousal is produced by emotional response to violent content, for example, then reducing violent content would help to achieve the desired result. Indeed, there is some evidence for this in the higher levels of arousal observed in this experiment in the violent viewing condition, and in the increased role arousal seems to play in this viewing condition (see Fig. 7, 8 and 9). But there are many other variables differing between viewing conditions which are not analyzed in this experiment, and they may also have effects on arousal. Form complexity, suspense and sexual responses have all been related to arousal. Arousal produced by these factors will not be reduced by eliminating violent content, and may have the same effect on subsequent anti-social behavior as arousal produced by emotional response to violence.

But we still have to account for some unexpected results. Again we can summarize these questions:

1. Why was no support found for the generalized arousal model?
2. Why did the comedy viewing condition consistently produce unexpected results at variance with the other two viewing conditions?
3. Why was prior aggression level not related to anti-social behavior?

The answer to the first question may lie in the nature of the behaviors permitted in this experiment. In the discussion of prior tests of the Arousal model, it was noted that most outcome behaviors measured were restricted to anti-social behavior. The test of the model typically was made by changing the arousal agent from violent content to some other stimulating but nonviolent material. The outcome of these tests are consistent with the result of this experiment. Here, too, higher levels of arousal predicted higher levels of anti-social behavior, even when ignoring the source of the arousal. In the single discussed experiment which permitted a choice of pro-social or anti-social behaviors after viewing, (Liebert and Baron, 1972), no support for generalized transfer of arousal to both kinds of behaviors was found. Again, we have replicated this effect.

The inconsistency here seems to be that two different effects were tested in the two different conceptualizations: the Tannenbaum and Zillman results stated that arousal from <u>different sources</u> could be transferred to the <u>same class</u> of behaviors, (i.e., anti-social behaviors) while the Liebert and Baron results state that arousal from the <u>same source</u>, (violent television programming,) was not transferred to <u>different classes</u> of behavior (both pro- and anti-social behaviors). In all, the results seem consistent with the idea that arousal from whatever source is transferred primarily to anti-social behaviors.

The question concerning the comedy viewing condition results is probably best answered by invoking "unmeasured variables" as an explana-

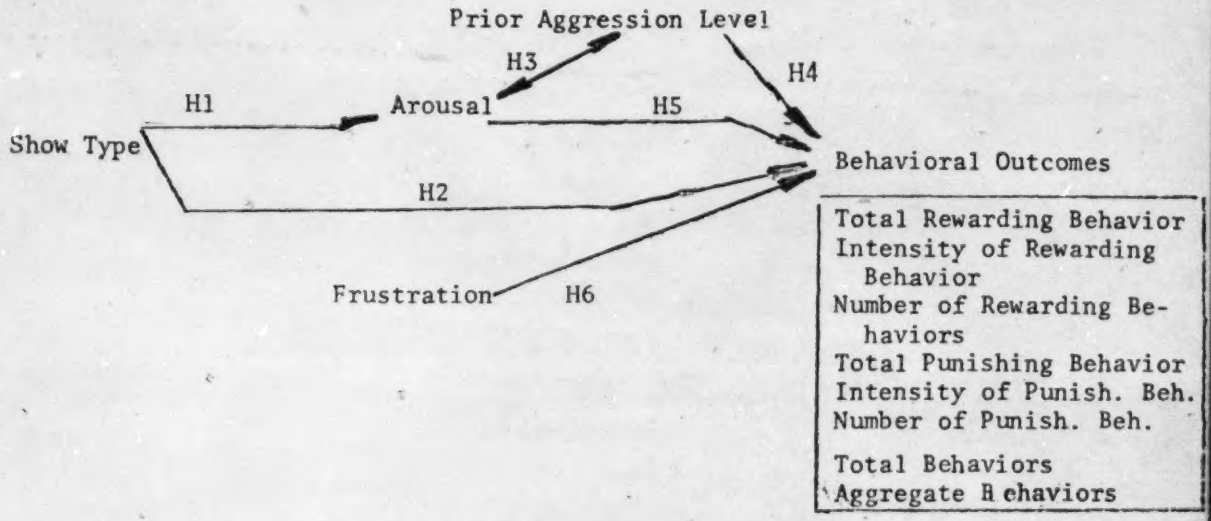
tion. The subjects in this condition showed the lowest level of arousal and the lowest rewarding behavior. This is consistent with a general arousal effect. But they also showed somewhat more than average punishment behavior, to which these low levels of arousal were negatively related. This is not consistent with general arousal.

One of the primary differences between the comedy situation and the other viewing conditions was the very high level of verbal conflict. There were many (humorous) shouting scenes and (unrealistic) threats. This verbal output might have specific effects, or it may be simply that the comedy situation elicits an entirely different response pattern. Of course, the results may be due to simple sampling error, but the alpha error probabilities observed make this doubtful. Comedic effects appear to need more careful study.

Finally, the question of prior aggression level and its lack of relationship to vitually every other variable must be addressed. Here, the danger of "proving" the null hypothesis must be clearly avoided. It is most likely that the measuring instrument was not sensitive enough to predict behavior in this instance. A self-report paper and pencil measure, describing primarily hypothetical situations, is inherently error prone. Real relationships may be detected in the presence of this error if the sample size is large enough, as it often is in surveys. But for an experimental study such as this one, with a fairly small sample, the instrument may simply be too insensitive to make accurate predictions. Another possible explanation is that college students tend to be a highly socialized segment of the population. Such individuals might agree with aggressive scale items but be inhibited from (or socialized against) overtly displaying aggressive behavior.

FIGURE 1

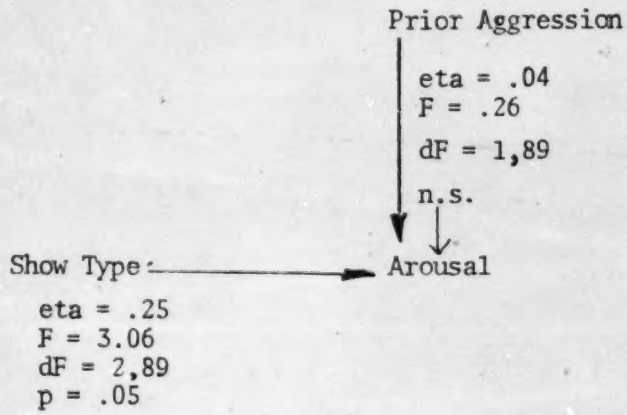
OUTLINE OF HYPOTHESES



NOTE: In tests of hypotheses, the critical level of alpha was set at $p \leq .05$ if $N > 50$, and $p \leq .10$ if $N \leq 50$.

FIGURE 2

PREDICTION OF AROUSAL BY SHOW TYPE AND PRIOR AGGRESSION



No significant interaction

FIGURE 3

RELATIONSHIP BETWEEN SHOW CONDITION AND SUBSEQUENT BEHAVIORS, CONTROLLING FOR PRIOR AGGRESSION LEVELS AND AROUSAL (ANALYSES OF COVARIANCE)

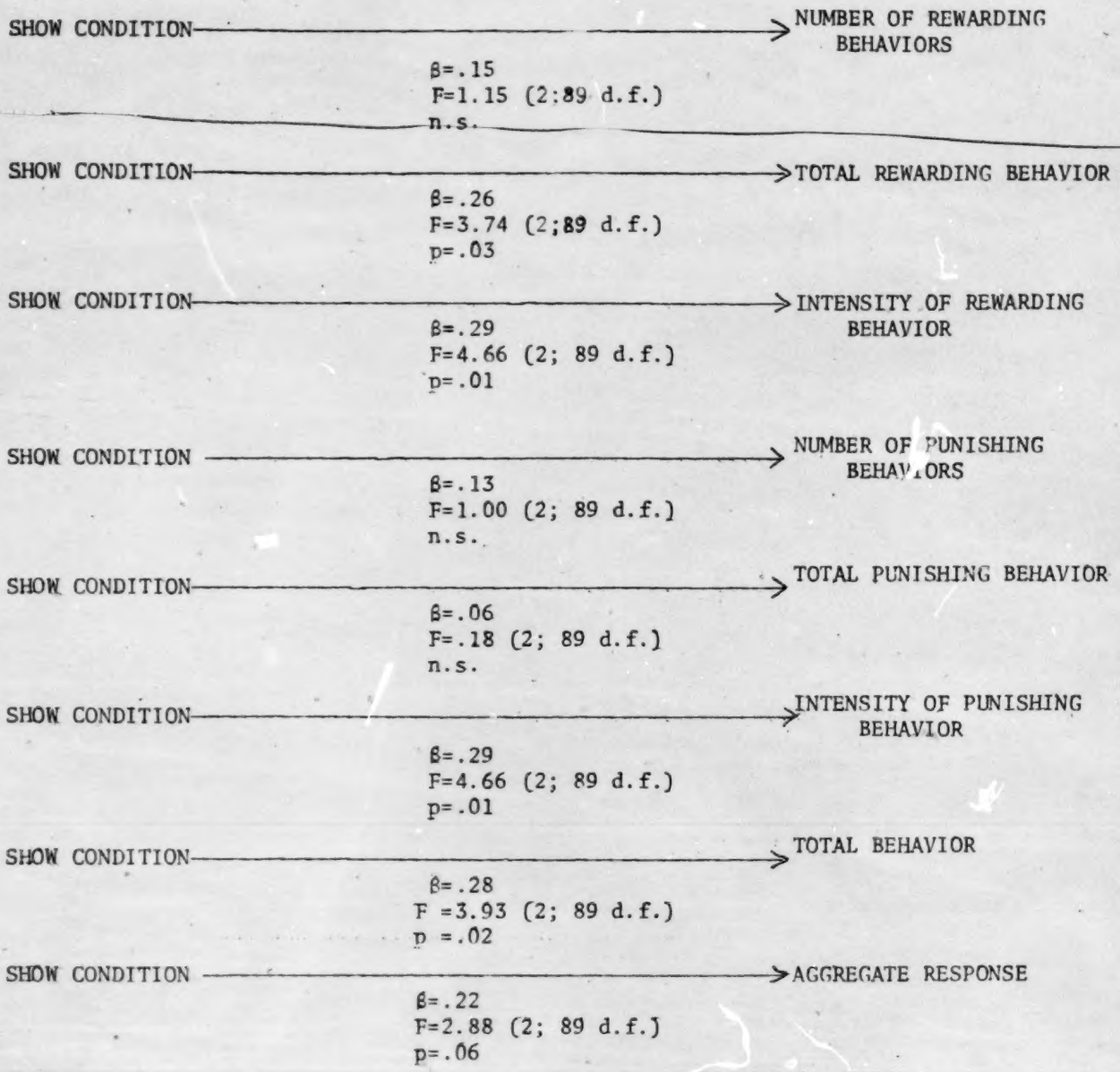


FIGURE 4

PREDICTORS OF NUMBER OF REWARDING BEHAVIORS

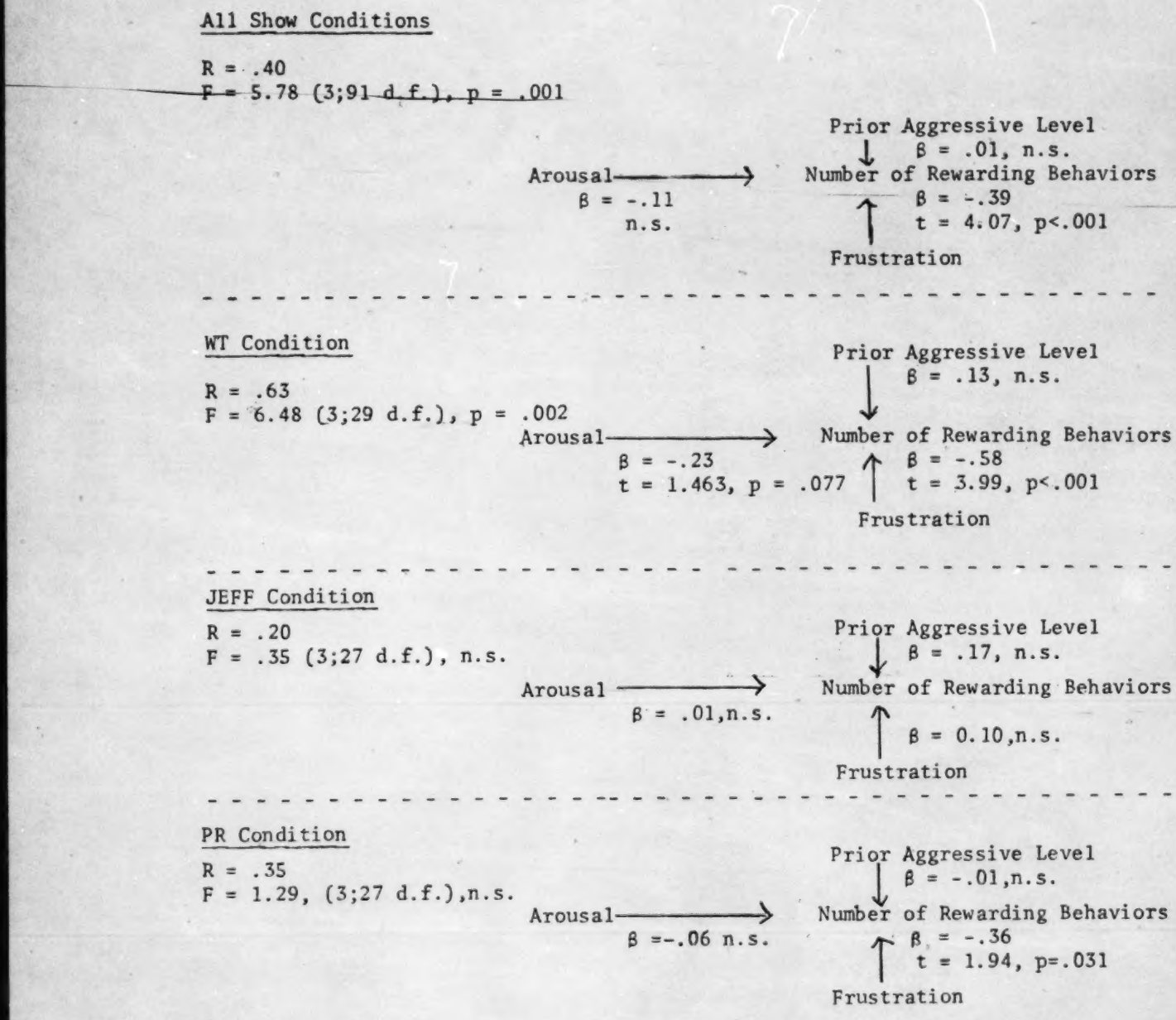


FIGURE 5

PREDICTORS OF TOTAL REWARDING BEHAVIOR

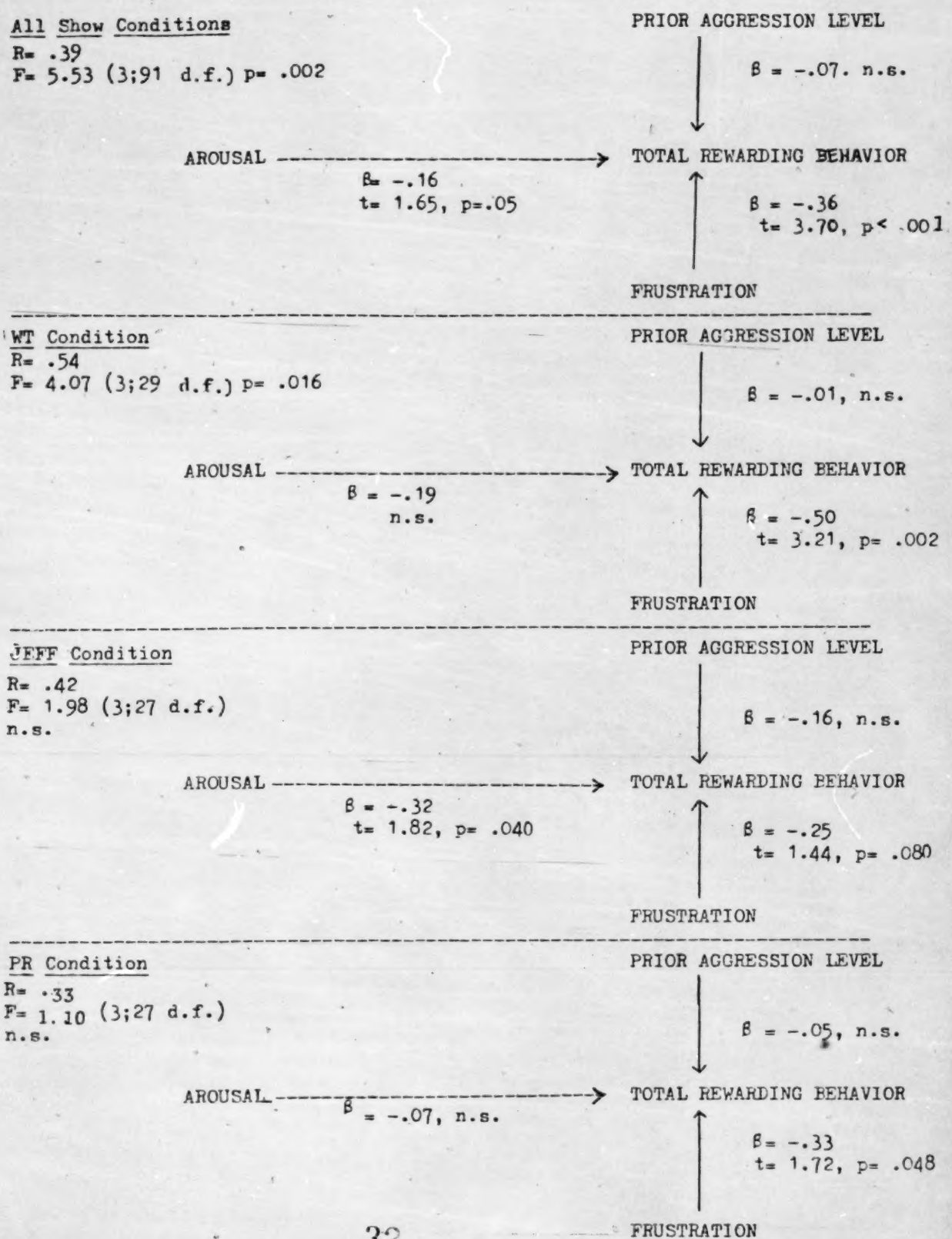


FIGURE 6

PREDICTORS OF INTENSITY OF REWARDING BEHAVIOR

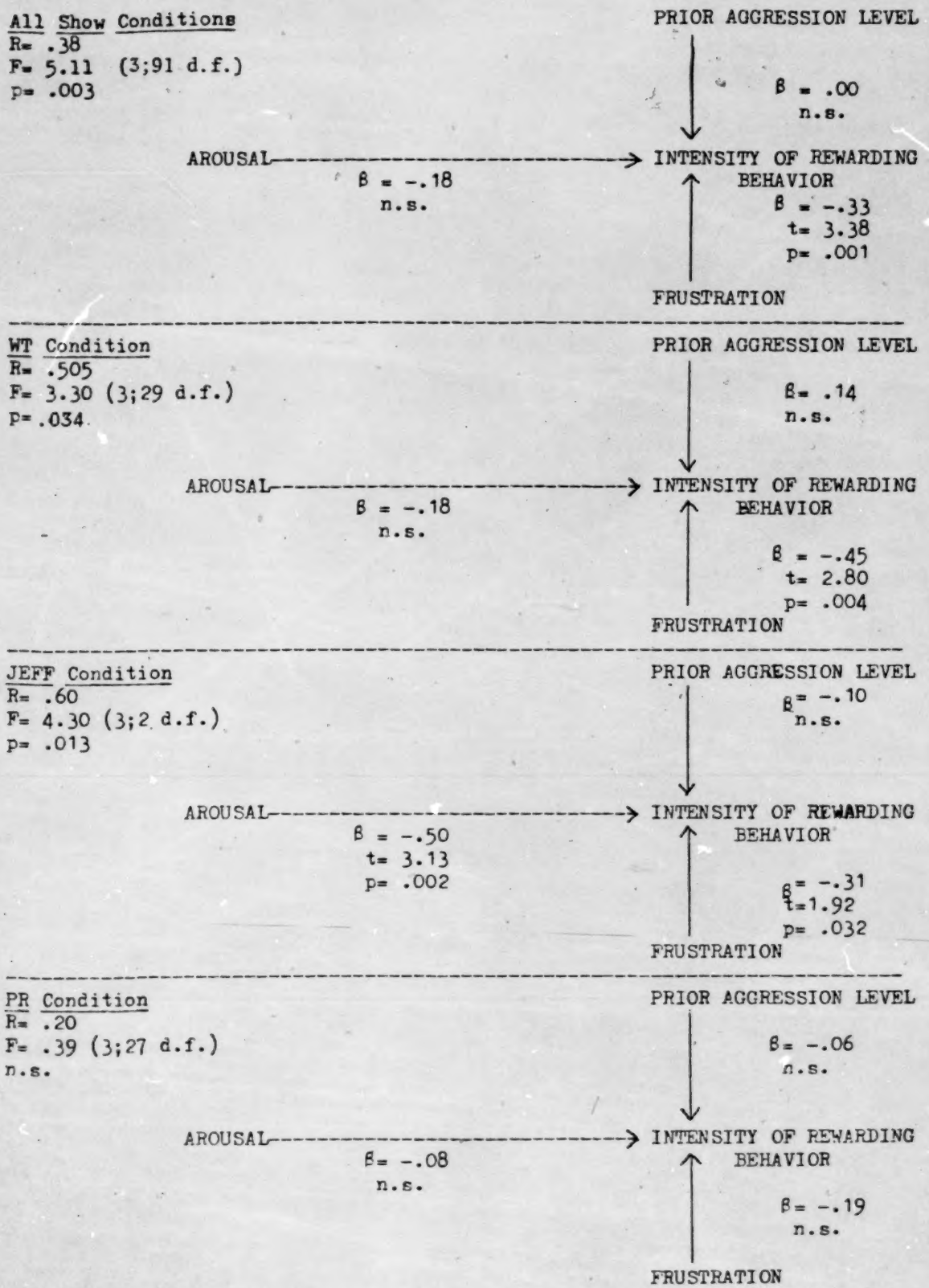


FIGURE 7

PREDICTORS OF NUMBER OF PUNISHING BEHAVIORS

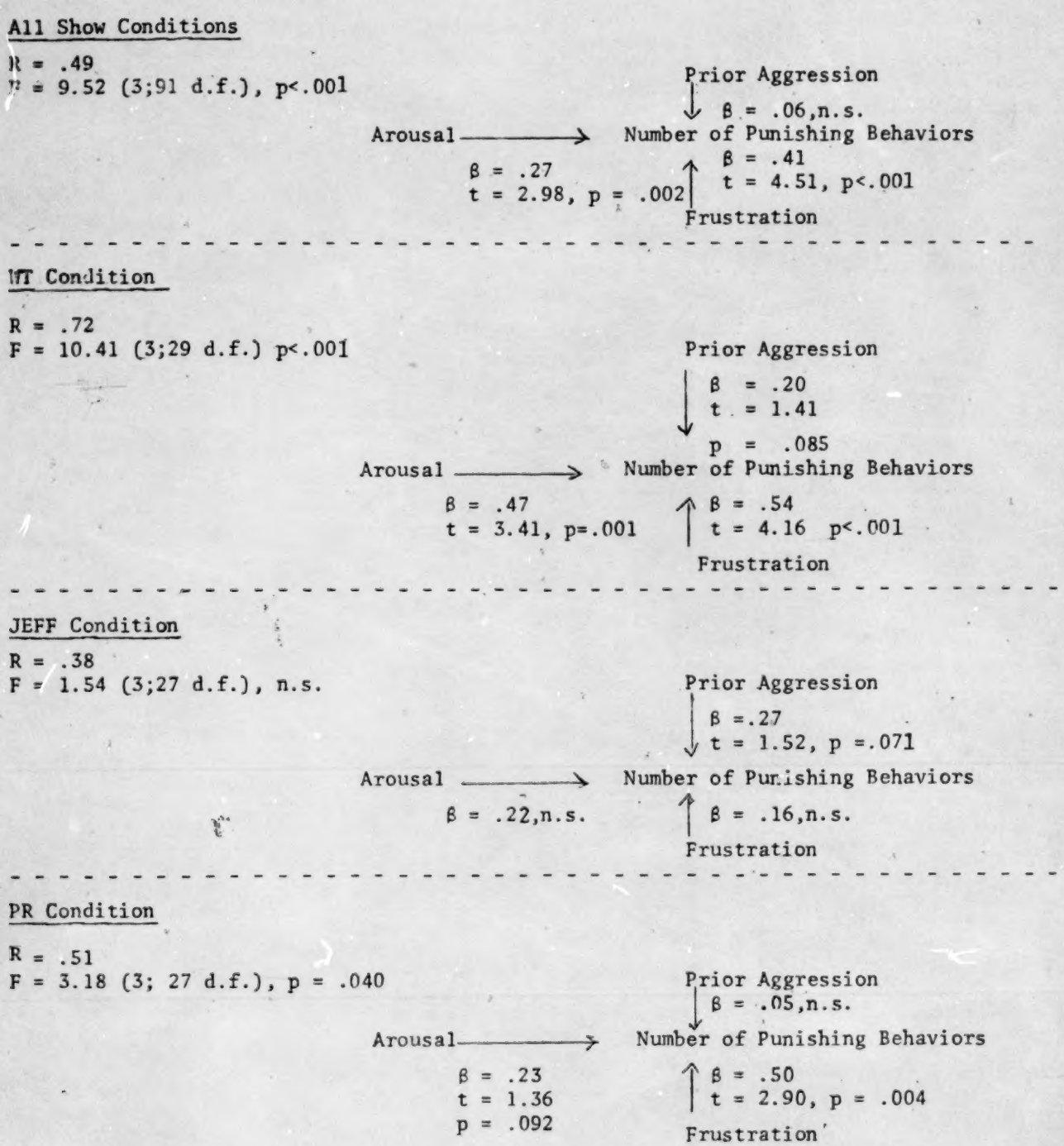


FIGURE 8

PREDICTORS OF TOTAL PUNISHING BEHAVIOR

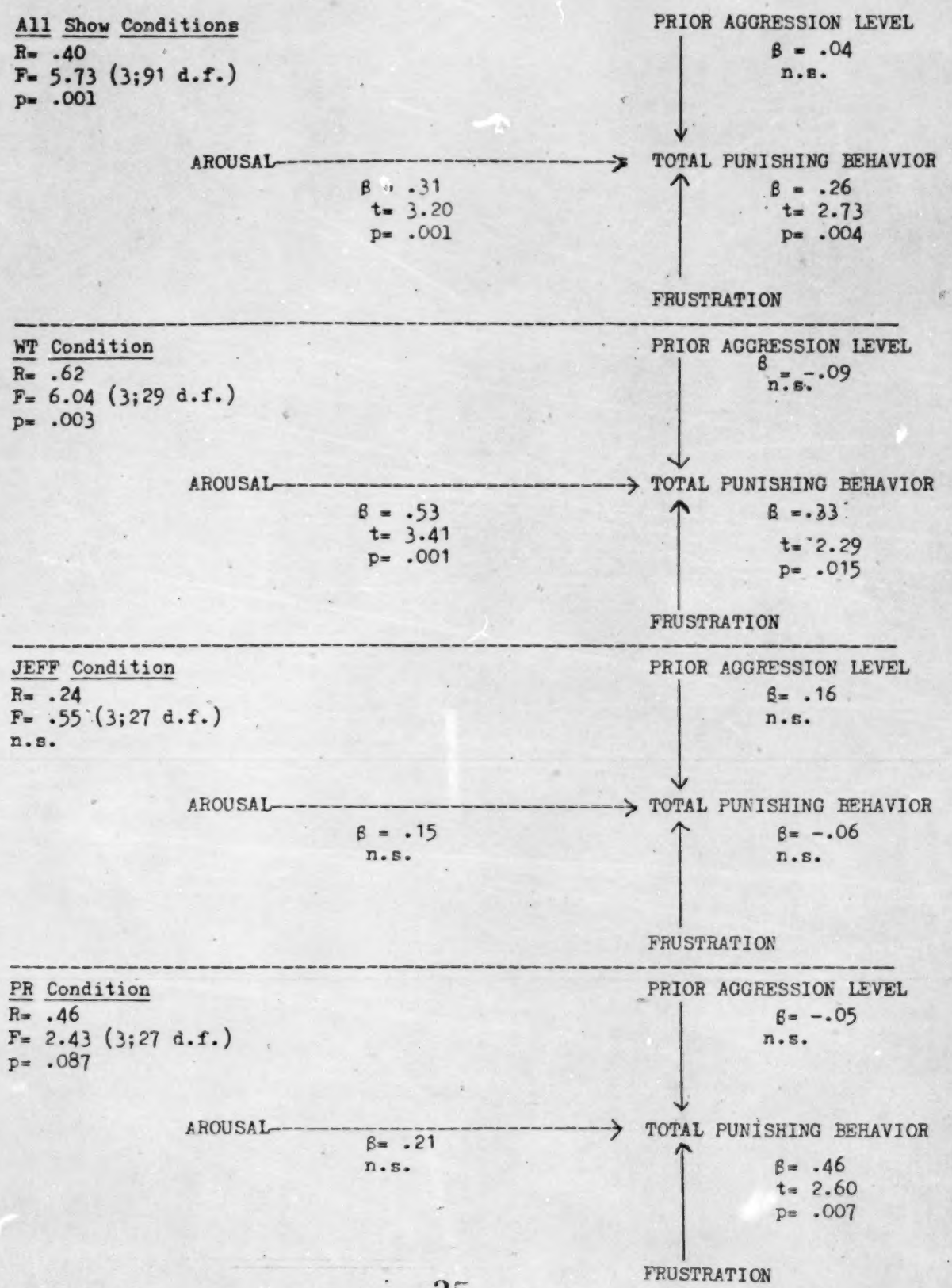


FIGURE 9

PREDICTORS OF INTENSITY OF PUNISHING BEHAVIOR

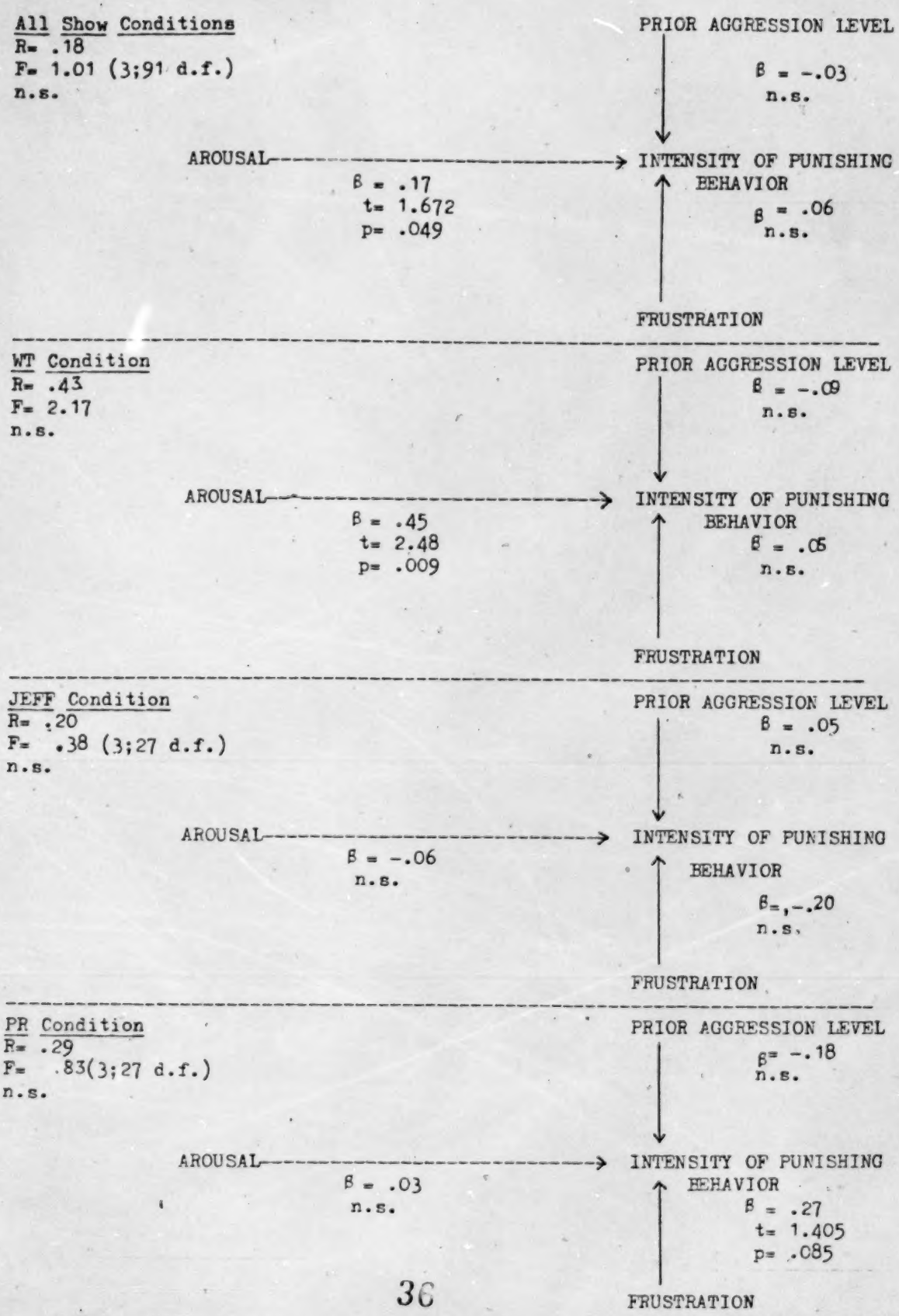


FIGURE 10

PREDICTORS OF TOTAL BEHAVIOR

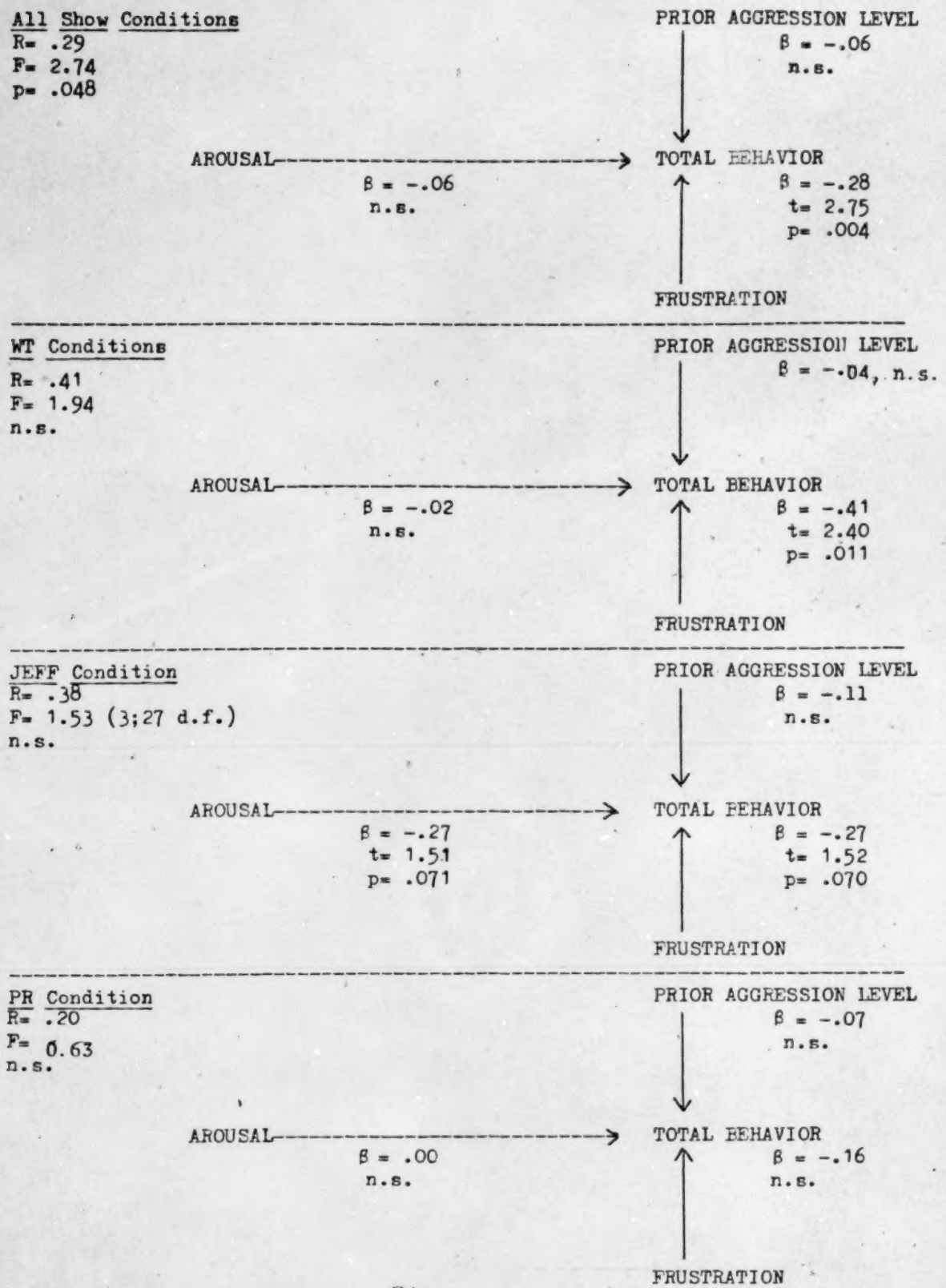


FIGURE 11

PREDICTORS OF AGGREGATE RESPONSE

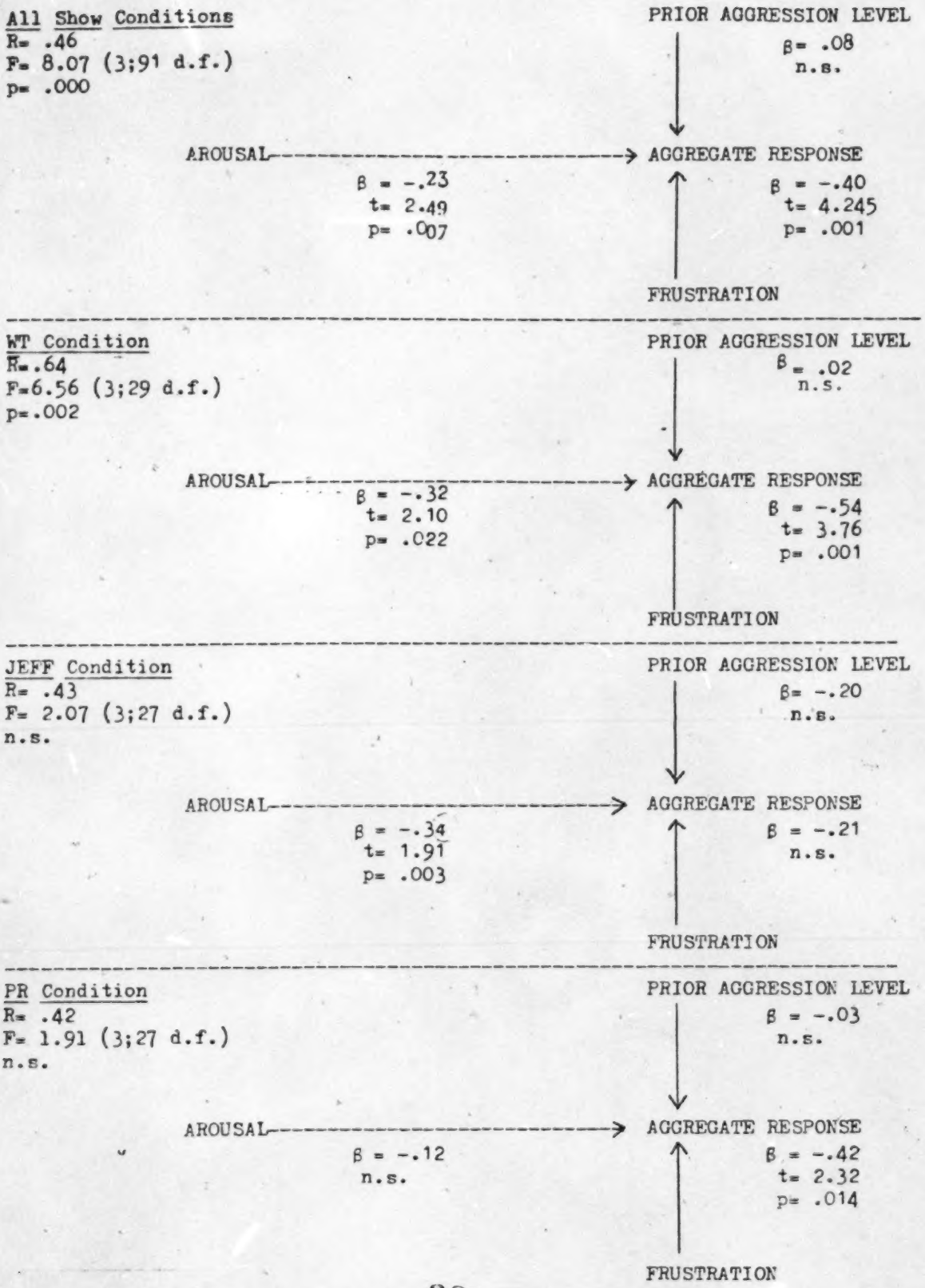


TABLE I

CELL MEANS: AROUSAL BY SHOW TYPE, PRIOR AGGRESSION LEVEL

Condition	PRIOR AGGRESSION LEVEL Low	High
WT $\bar{x}$	.55	9.3
s.d.	25.51	12.51
n	21	12
JEFF $\bar{x}$	-8.46	-7.8
s.d.	21.08	19.06
n	17	14
PR $\bar{x}$	1.85	-1.0
s.d.	19.43	15.53
n	16	15

TABLE II

CELL MEAN DEVIATIONS (ADJUSTED FOR COVARIATES) OF SUBSEQUENT BEHAVIORS WITHIN EACH SHOW CONDITION

BEHAVIOR	DEVIATION FROM GRAND MEAN BY SHOW CONDITION			GRAND MEAN
	WT	JEFF	PR	
NUMBER OF REWARDING BEHAVIORS	-.39	-.41	.82	11.00
TOTAL REWARDING BEHAVIOR	-.77	-7.17	7.99	36.58
INTENSITY OF REWARDING BEHAVIOR	-.14	-.43	.57	3.04
NUMBER OF PUNISHING BEHAVIORS	-.21	.49	-.26	2.38
TOTAL PUNISHING BEHAVIOR	-.53	0.00	.56	7.37
INTENSITY OF PUNISHING BEHAVIOR	-.20	-.27	.48	2.16
TOTAL BEHAVIOR	-1.30	-7.17	8.55	43.95
AGGREGATE RESPONSE	-.25	-7.17	7.43	29.21

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